
Microsorium whiteheadii (Polypodiaceae), an Attractive New Species from Sumatra

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ABSTRACT. We describe and illustrate *Microsorium whiteheadii* (Polypodiaceae), endemic to limestone outcrops in Sumatra. It appears related to the widespread and polymorphic *M. punctatum* (L.) Copeland but differs from that species by the shorter-creeping rhizomes, more succulent, thicker, very dark green, oblanceolate blades, prominent hydathodes adaxially, and less visible venation.

Reggie Whitehead, a fern enthusiast and grower in the Miami area, has drawn our attention to a remarkable new *Microsorium* from Sumatra, growing epipetrically on limestone cliffs. In the recent treatment of this genus for *Flora Malesiana* (Bosman et al., 1998), and also in Bosman's (1991) previous monograph of *Microsorium*, *M. whiteheadii* would appear to key to *M. punctatum* (L.) Copeland, but we believe *M. whiteheadii* is quite dramatically different in several characters, discussed below. This attractive new species is now being successfully grown and propagated (from spores) by Mr. Whitehead in the Miami area and by John Banta, in Alva, Florida (near Ft. Myers), and we honor Mr. Whitehead's efforts by naming this fern for him. Both growers were led to the same area by Tang Fook Leong, on an expedition to relocate *Amorphophallus hirsutus* Teijsmann & Binnendijk (Araceae).

Microsorium whiteheadii A. R. Smith & Hoshizaki, sp. nov. TYPE: Sumatra. Western Sumatra, Prov. Paya Khumbu, Koto District, 30 km from Bukit Tinggi, Tanjung Gadang Rumah (near Paya Khumbu), 900 m, 2 July 1997, Reggie Whitehead s.n. (holotype, UC; isotypes, BO, L, MO, US). Figure 1.

Differt a *M. punctatum* rhizomatibus breviter repentibus internodiis 2–5(–7) mm longis, laminis succulentioribus crassioribus oblanceolatis vel spatulatis abrupte reductioribus proximaliter, prominentioribus hydathodis adaxialiter, venis lateralibus vix visibilibus in statu vivo, venis areolatis non visibilibus.

Rhizomes terete, in living material medium green (not glaucous) below the scales, ca. 5–10 mm thick, short-creeping, internodes 2–5(–7) mm long, roots densely set and forming a thick mat; vascular strands numerous, lacking sclerified sheaths but with numerous sclerenchyma strands (> 100) scattered uniformly throughout the cortex; rhizome scales brownish, lacking a lighter colored or hyaline margin, clathrate, pseudopeltate, appearing peltate by virtue of overlapping basal auricles, moderately dense, ovate with an attenuate tip, 3–5 × 1.5–3 mm, the bases appressed, the tips often squarrose, margins erose-denticulate to coarsely dentate or with scattered 1- to 3-celled glandular hairs, otherwise glabrous, the basal cells ± isodiametric, the cells at the attenuate tip rectangular, up to 2–3 times longer than wide and often darker and thicker-walled than walls of basal cells. *Fronds* monomorphic, sessile, thick-coriaceous and somewhat succulent (like India rubber plant, *Ficus elastica* Roxburgh). *Stipes* absent or less than 1 cm long, up to ca. 5 mm diam., with ca. (3–)4–6(–9) round vascular bundles arranged in a cup in cross section (two adaxial bundles much larger than the others), glabrescent or with a few linear-lanceolate clathrate scales at the very base; stipes of young fronds beset with evanescent scales. *Blades* simple, broadly to less often narrowly oblanceolate, mostly 20–65(–78) × 7–9(–13) cm, margins entire, base abruptly narrowed and with a narrow laminar wing nearly or quite to the rhizome, the wing ca. 1 cm or less for 10(–25) cm, blade tips rounded to subacute or acuminate; abaxial surfaces glabrous or glabrescent at maturity, when young with a scattering of minute 1- to 3-celled uniseriate glandular hairs; blades of newly formed croziers covered with glandular hairs like those of stipes. *Venation* (of large and fully developed fertile and sterile fronds) type 4 (terminology of Nooteboom, 1997: 262–263), with the first connecting veins (between main lat-

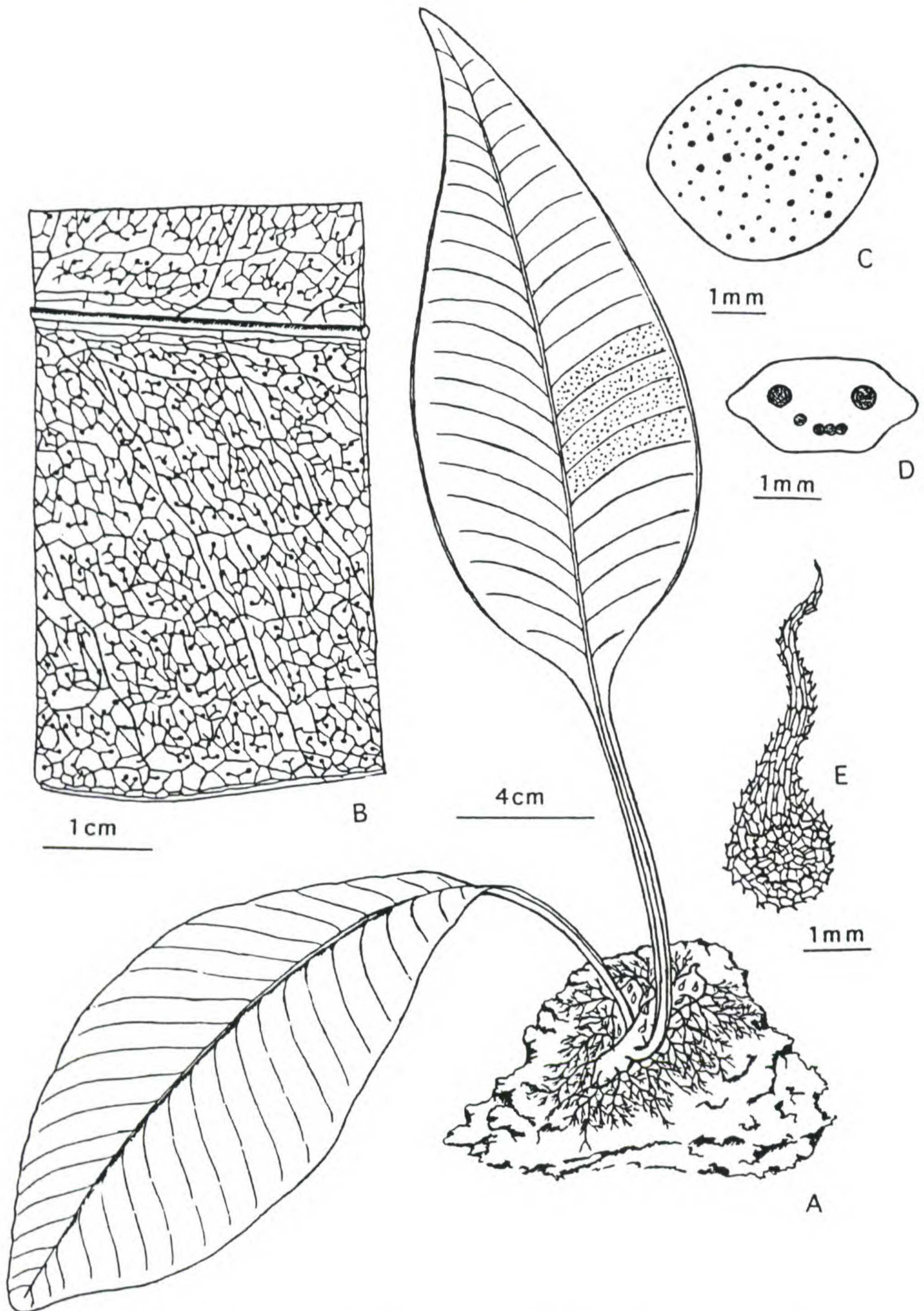


Figure 1. *Microsorium whiteheadii* A. R. Smith & Hoshizaki. (A, C–E drawn from material in cultivation, garden of Reggie Whitehead; B from holotype). —A. Habit. —B. Venation. —C. Rhizome cross section, showing numerous, scattered sclerenchyma bundles. —D. Stipe cross section, with two large adaxial and several smaller abaxial vascular bundles. —E. Rhizome scale.

eral veins) forming one row of small primary costal areoles parallel to costa (midrib), then with up to ca. 6 larger areoles in a row between two main lateral veins (Fig. 1B), lacking a prominent veinlet (tertiary vein) parallel to the main lateral veins; smaller fronds with venation type 1, with connecting veins forming a row of about equal-sized areoles between two adjacent veins (lacking a narrow costal areole); veins immersed or vague, main lateral veins and connecting veins faintly visible on both sides of blades as whitish lines, main lateral veins up to ca. 20 mm apart at their origin, connecting veins mostly 6–10 mm apart, \pm straight or slightly zigzagged, irregularly branched near margin, catadromous, smaller veins completely immersed and not visible or extremely vague, variously anastomosing; free veinlets mostly simple, occasionally 1-forked; veins ending in prominent hydathodes adaxially. Sori separate, round, occasionally two sori joined (and thus the “fused” sori are oblong or slightly elongate), superficial, ca. 1.0–1.5(–2.5) mm diam. at maturity, seemingly \pm irregularly scattered on the smallest veinlets or appearing in irregular rows, in fully developed fronds roughly in 6 to 10 such irregular rows between and parallel to main lateral veins, each row containing 2 to 4 sori in a file within each primary areole (as defined by the connecting veins, which are \pm perpendicular to main lateral veins), thus roughly 12 to 40 sori per primary areole; sori exindusiate, ca. 10 to 15 (to 22) per sq. cm, over the whole surface of the lamina except on the abruptly narrowed blade base and the extreme tip, as well as in the costal areoles; sporangial capsules nearly globose, paraphyses lacking.

Habitat. Growing on limestone outcrops, at a site being mined for marble and adjacent to a marble processing plant. Mining is likely to have destroyed the species at this particular site. An aroid at this same site, *Amorphophallus hirsutus*, may also have been lost; it had been known only from this location, and no one has seen it since the early 1900s. Nearby sites, where other marble outcrops occurred, had previously been reduced to rubble. Specimens of *Microsorium whiteheadii* were sought from these areas, and the adjacent bushy area surrounding the outcroppings, without success. Specimens were not found on trees in the area (Whitehead, in litt.).

Microsorium whiteheadii appears to be mostly closely related to *M. punctatum*, widespread in the paleotropics and subtropics throughout tropical Africa, Madagascar and Mauritius, southern India, southeast Asia (including southern China), Malesia, northeastern Australia, New Caledonia, and west-

ern Polynesia (Bosman, 1991). In the recent treatment of this genus for *Flora Malesiana* (Bosman et al., 1998), and also in Bosman's earlier monograph of *Microsorium* (Bosman, 1991), *M. whiteheadii* will key to *M. punctatum*, but we believe *M. whiteheadii* is dramatically different in several important characters. Bosman (1991) and Nootboom (1997) listed 21 heterotypic synonyms of *M. punctatum*, but only one of these, *Polypodium antrophyoides* Alderwerelt, has a Sumatran type (Palembang, *Forbes 3119*, BM not seen); from its original description and the area from which it was collected, we believe that it cannot be conspecific with *M. whiteheadii*.

From *Microsorium punctatum*, which is similar in having undivided blades, superficial, irregularly scattered sori, and very complex, reticulate venation with more or less equally sized areoles, our new species differs in having generally shorter creeping rhizomes (internodes usually more than 1 cm and often more than 2 cm in *M. punctatum*), thicker, more coriaceous yet subsucculent blades (both living and pressed specimens), shorter and more abruptly tapering blade bases and more oblanceolate blades that are generally broader distally than in *M. punctatum* (proportional to the blade base), more decidedly immersed veins, and somewhat larger and fewer sori per sq. cm. Rhizomes of *M. punctatum* are described as generally drying glaucous or whitish, and we confirm this in herbarium specimens; we have not seen this coloration in dried rhizomes of *M. whiteheadii*. The venation of *M. whiteheadii* is somewhat similar to that illustrated for *M. punctatum* by Nootboom (1997, pl. 13, figs. 43, 44), but even more complex, with a greater number of the smallest areoles contained within the primary areoles. We did not find paraphyses in the sori of *M. whiteheadii*, even in the youngest fronds or fluid-preserved material of young sori; Bosman et al. (1998) described sori of *M. punctatum* as paraphysate, having simple uniseriate hairs with glandular tips in the sori, but we are unable to confirm this in living and herbarium material available to us. As seen in living material, the midrib in *M. whiteheadii*, as viewed adaxially and above the base, is not or only slightly raised, and if raised it is gently rounded in cross section as opposed to the condition in *M. punctatum*, where the midrib is sharply raised and bluntly keeled in cross section. Hydathodes of living plants of *M. whiteheadii* may be seen with the naked eye but are difficult to see in *M. punctatum*, even with a 10 power hand lens.

Microsorium punctatum is quite common and variable, both in nature and in cultivation, and so is familiar to many fern growers (Hoshizaki, 1982, as

Polypodium polycarpon Cavanilles ex Swartz, a synonym). *Microsorium whiteheadii* appears to us to be an even more attractive plant, with its thicker, dark glossy-green fronds. It has so far proven relatively easy to grow from rhizomes or spores, on soil, peat-rock mixtures, or sphagnum moss, either terrestrially or epiphytically in hanging baskets. The isotypes have been propagated and grown from plants originally gathered at this locality by Mr. Whitehead. Locality information was provided by Tang Fook Leong.

Microsorium is sometimes recognized in a narrow sense, to include those species with numerous scattered, superficial (not deeply sunken) small sori (e.g., by Hennipman et al., 1990; Bosman, 1991). Others now combine *Phymatosorus* with *Microsorium* (e.g., Nootboom, 1997; Bosman et al., 1998). Regardless of the circumscription of *Microsorium*, *M. whiteheadii* is clearly a member of this genus in the narrow sense, should one wish to restrict it.

Paratype. SUMATRA. **Western Sumatra, Prov. Paya Khumbu:** 30 km from Bukit Tinggi, 900 m, ca. Dec. 1995, Banta s.n. (UC, a fertile frond from B. J. Hosh-

izaki via Whitehead via Banta; MO, with rhizome, obtained directly from Whitehead and also from Banta's original plant). This locality is the same as that of the type.

Acknowledgments. We thank Reggie Whitehead and John Banta, fern growers in the Miami area, for sharing specimens of *M. whiteheadii* with us and for providing some of the extreme measurements of more luxuriant fronds in plants under their care. We also thank Debbie Lamb for the illustration.

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